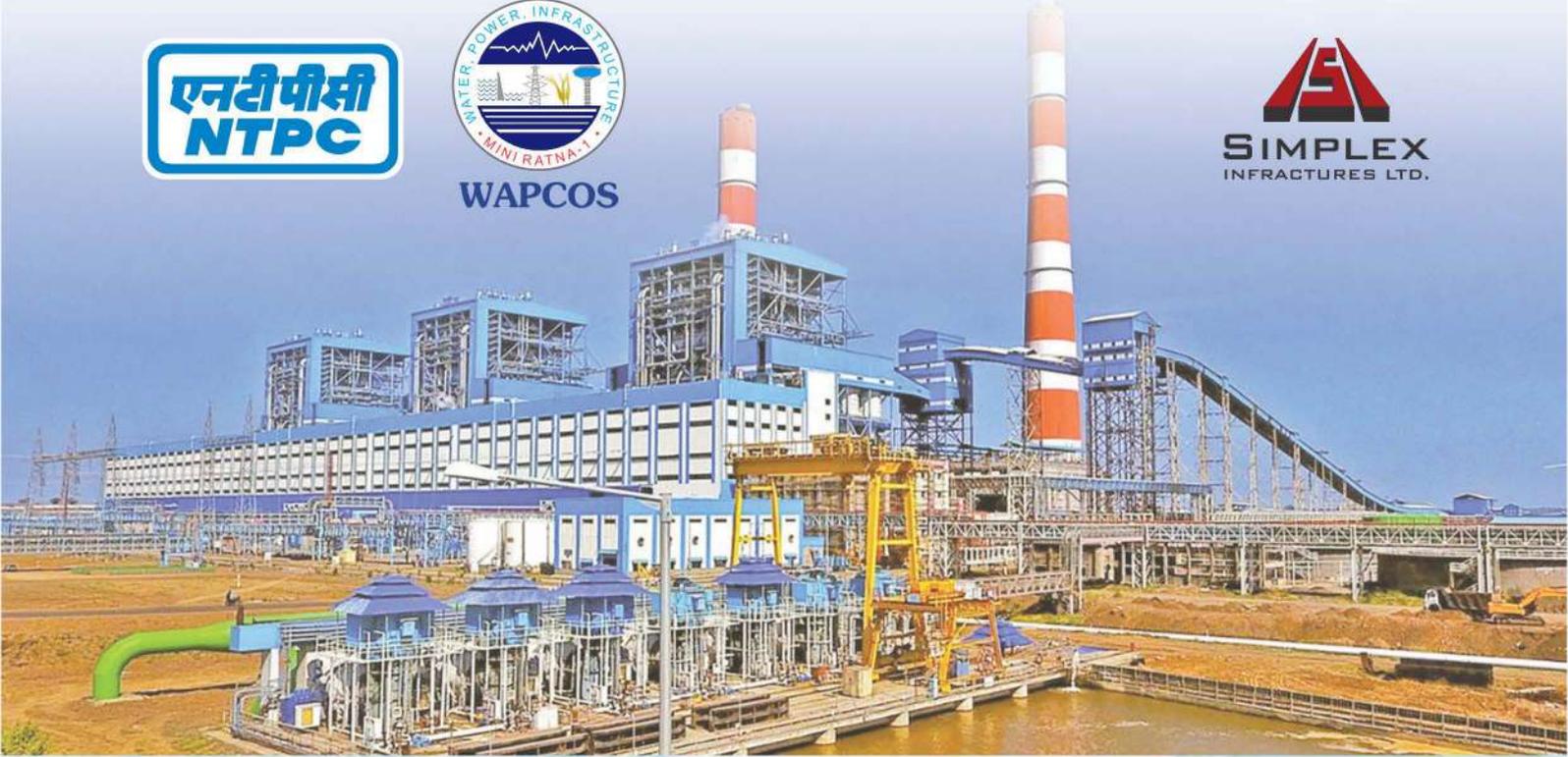


Aqua's SubCF pumps for Raw Silty Water Intake

North Karanpura STPP

3 x 660MW Super Thermal Power Plant



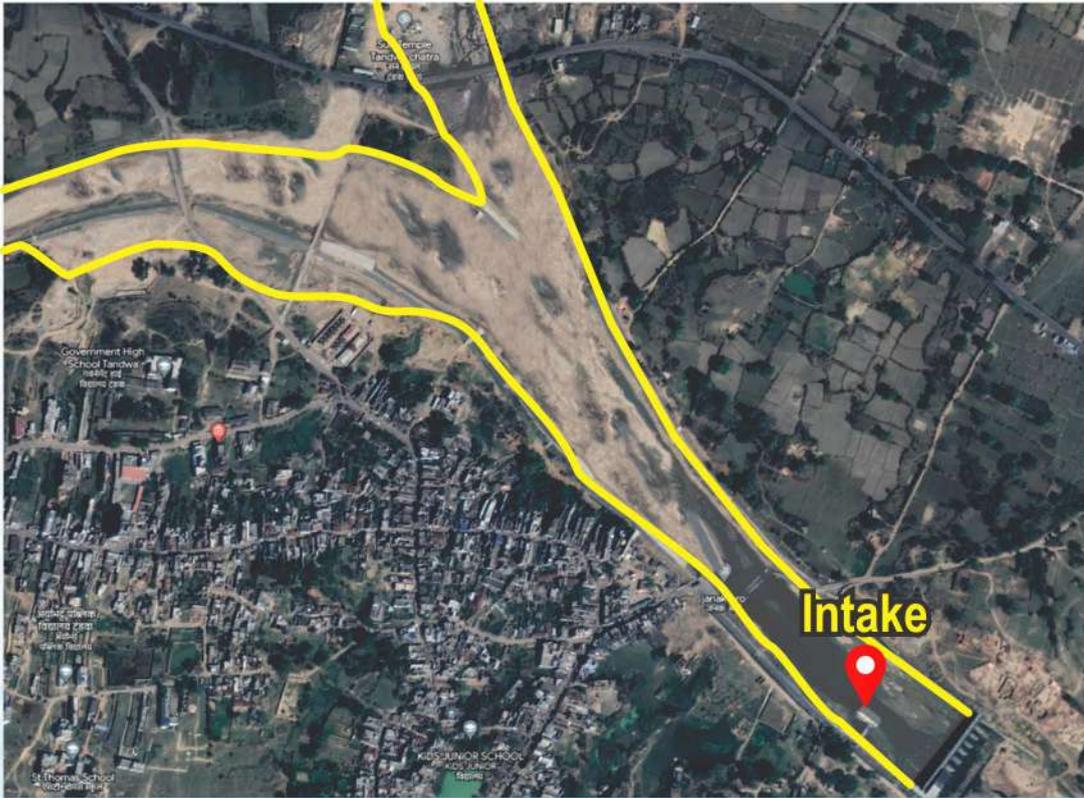
North Karanpura Thermal Power Station is a Coal based STPP located in Tandwa town in Chattra district, **Jharkhand** & is owned by m/s NTPC Limited which is the **largest** Power Company of India with a capacity of **71,594MW** (as on 15th August, 2023 & it contributes to over 25% of total power generation of India).



Situation:

Water is one of the key input requirements for thermal power generation - it is required for process cooling in the condenser, ash disposal, removal of heat generated in plant auxiliaries, and various other plant consumptive uses.

A **large impounding reservoir** type water body is typically used for sourcing raw water as it has the benefits of storing the raw water; settling down the silt; so that the Raw Water Intake Pumps would have to encounter less Silt - but **such a large storage reservoir** would cover a **large area** to the tune of **5000 Acres** & force **Rehabilitation** of population/villages & **submergence of forest/fertile land**.... ⚠️



Garhi is Non-Perennial River...

The River Garhi is a rain fed river & remains **dry** in non-monsoon periods - i.e. nearly **8 to 9 months** & water is available only during the 3-4 months monsoon. ⚠️



... & it's Water is **Very Turbid** with a lot of Silt.

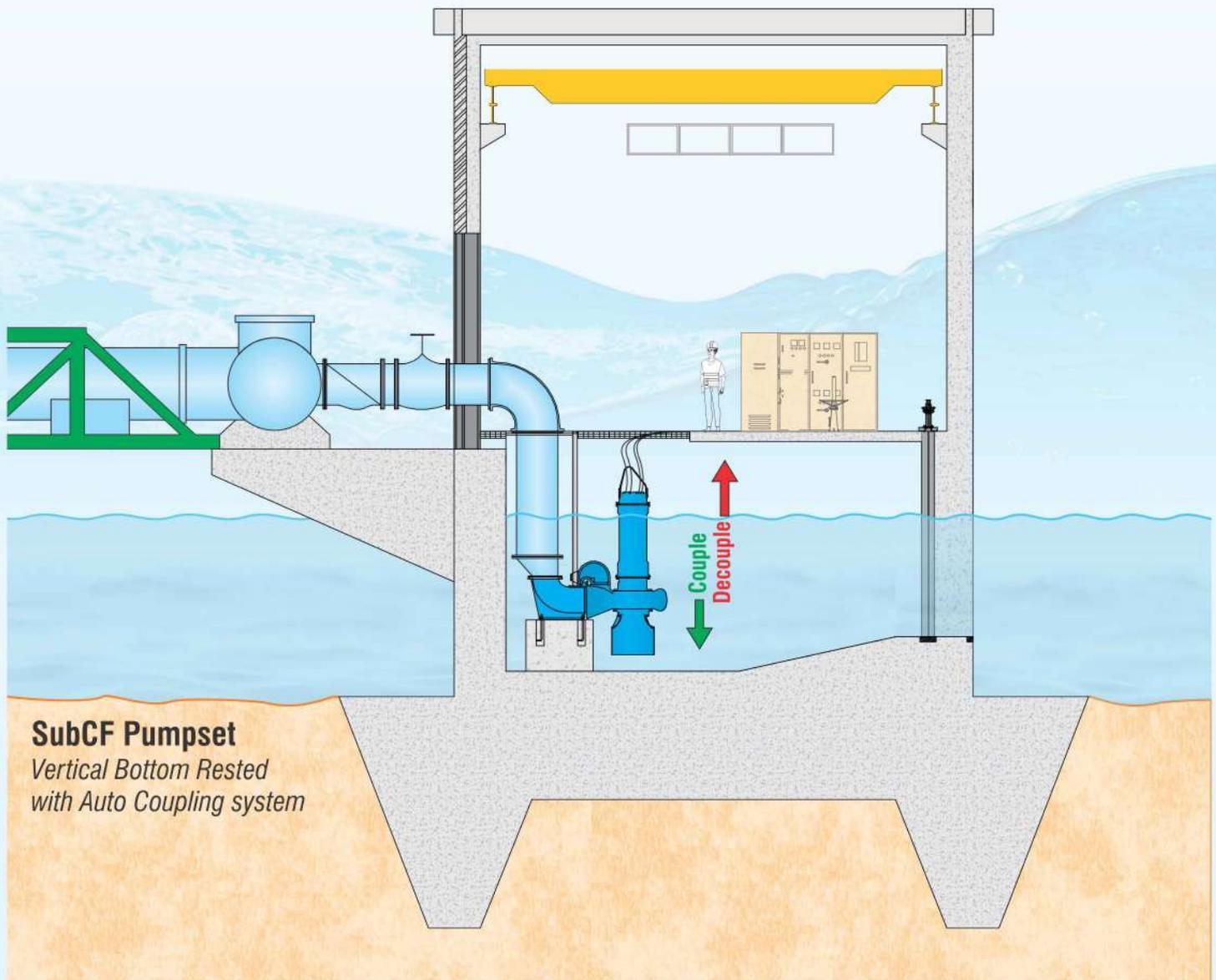
💡 To avoid the resettlement of villages & acquisition of forest/fertile land, a Compact scheme is used wherein the arrangement for lifting of water is during the narrow 3-4months monsoon period with a **very Small storage Barrage** of just 6m height & 121m length encompassing **just 800 Acres within the river gorge**... ⚠️



The low height barrage is executed **within the river regime** & the Intake pump house is just 100 m u/s of barrage **for pumping the Turbid Silty monsoon water directly** to a Large Raw Water Reservoir (*within the Plant Boundary*) from where settled; de-silted water required for year round usage is made available.

AQUA SUBMERGED CENTRIFUGAL PUMPSET (ARS)			
Model	Qty.	Flow	Head
ARS_V_AC_1st_VoG_5063_MQ_L...._0315_00415_NJ.	6 Nos. (4W+2S)	3000 m ³ /hr	20
End User :	Consultant:	Aqua's Customer :	
 NTPC Ltd.	 WAPCOS	 SIMPLEX INFRASTRUCTURES LTD.	

This is a true example of sustainable development without using existing resources and using untapped monsoon flows - avoiding the resettlement of 10 villages, rehabilitation of about 220 nos. of families & avoiding Land acquisition of about 4200 acres of fertile/forest land.





Vertical + Auto Coupling Installation

This represents the **most Economical & most User-friendly** pumping station design. The Pumpset is installed directly at the bottom of the Intake Well using **Aqua's Automatic Coupling System**.

The Auto Coupling system ensures that the Pumpset is properly Lowered (& firmly connected to the discharge piping) or Lifted out (disengaged from discharge piping) in a **simple & precise manner within MINUTES...!**

It uses Guide Rails (which guide the pumpset correctly downwards) till its discharged flange matches that of the auto coupling pedestal.

The contacting surfaces are well machined & designed such that the weight of the pumpset & wedge design of auto-coupling ensure a leak-free joints.

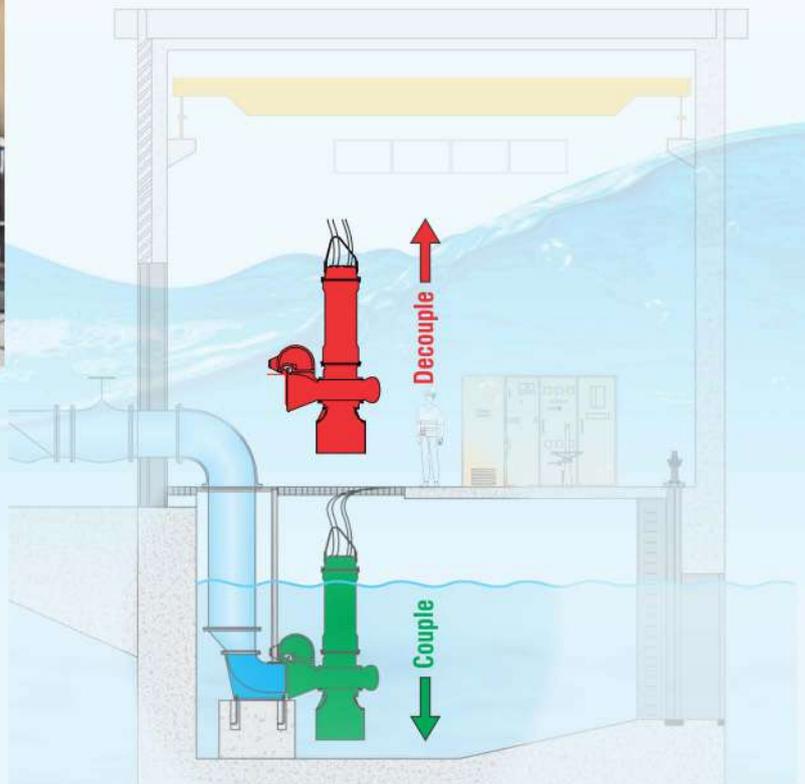
The pumpset is kept in place by its weight - **there is no need for any fastening of Bolt-Nut** to clamp it to the delivery piping.

Removing the pumpset for maintenance is equally simple - **just pull it up; there are no bolts to be dismantled** (the operator need not enter the sump once the automatic coupling system is fitted).



User Friendly (Couple / Decouple)

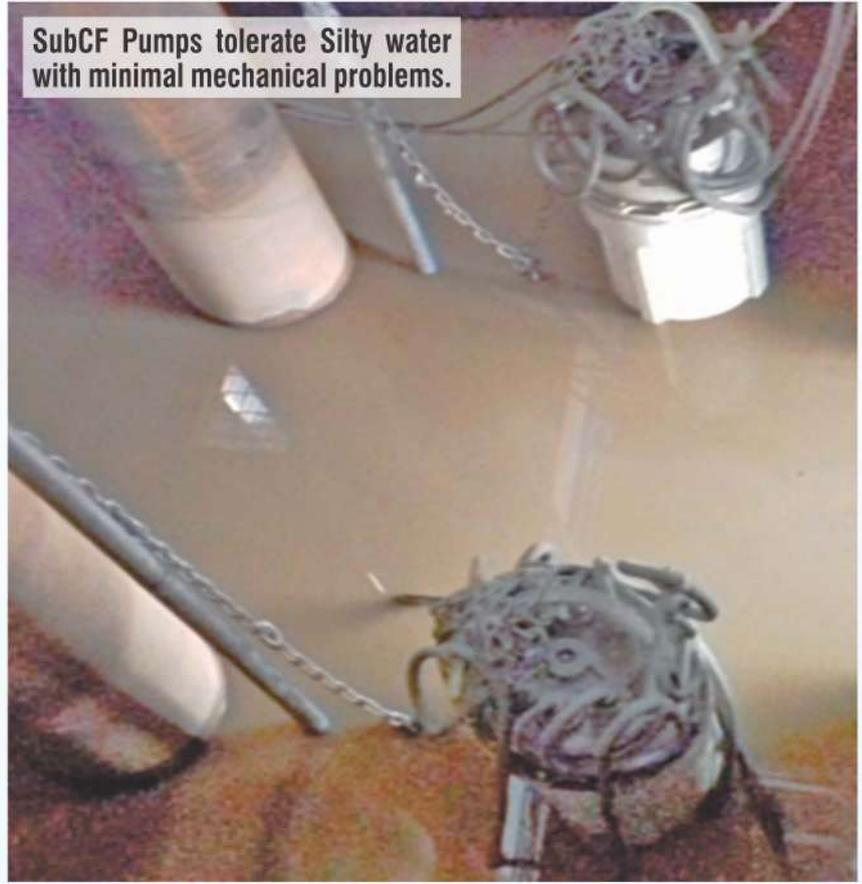
The use of Auto Coupling system enables Installation / Removal in matter of minutes (for cleaning silt, gravel, pebbles, grass, plastics, etc stuck up in suction strainer)



As the Pump can be installed - removed within minutes; it is also possible to run All the Installed pumps (ofcourse within the limits of permissible high head range) & keep Standby pumps out of the Pumping Station - i.e. Store Standby. This is useful in case of Non Perennial water inflows when temporary pumping rate needs to be increased (over & above the planned rate)

Installation at Site:

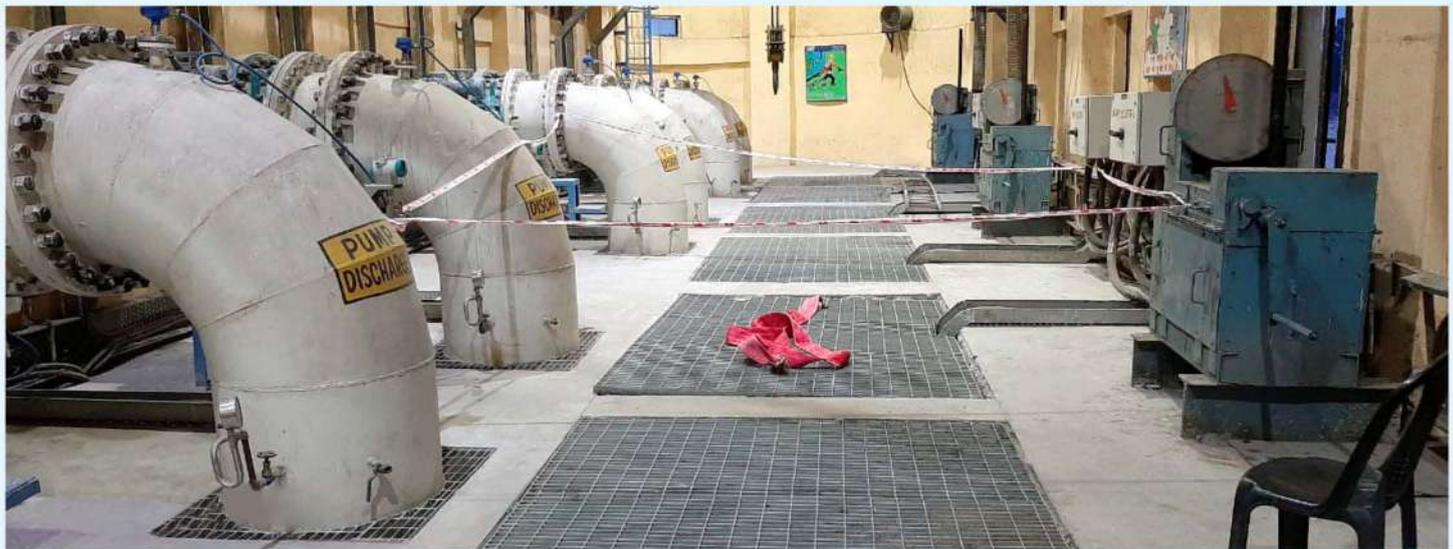
Pumpset being unboxed



SubCF Pumps tolerate Silty water with minimal mechanical problems.

Earlier Technology pumps & motors are to be assembled (*built-up*) at the site where even minor misalignment may cause premature breakdowns & may throw up nasty surprises of motor-pump incompatibility.

In contrast, SubCF pumpsets are Factory Built & Tested as a **Completely Built-Up Unit (CBU)** ensuring fully harmonious inter-component performance enabling an “**UnBox, Plug & Play**” unit which ensures **Zero Assembly Errors at the site.**



Concept Benefits:

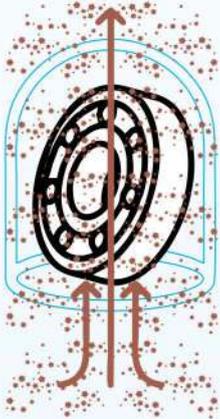


Robust & Reliable

- **No Failure** of Bearings despite **high silt** in water
- **No Rusting/ Galling** of Bearings despite **upto 9months of rest**

Conventional Pumpset

(utilizes Water Lubricated Pump Bearings & Leakage Prone Rope Glands)



Rope Packing in Cast Iron Gland

Pump Bearings are exposed to **Silt Water** leading to their **Erosion** & possible **Premature Failures**.

Submerged Pumpset

(utilizes Two, Zero Leakage Mechanical Seals)



Mechanical Seal in Stainless Steel Gland

Bearings are located deep inside the motor & are **Totally Sealed** by **Two Mechanical Seals** thereby are **totally Protected** from Water, Silt, Rust & Galling



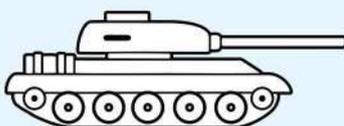
Robust, Multiple DE Bearing arraignments, easily tolerate **Heavy Thrusts** (*emanating due to wide head variation*) for **L_{10h}** life upto **1,00,000h**



Anti Drip, Fully Synthetic; Super Premium Grease ensures a minimum Regreasing Interval (*F10h*) of upto **75,000 h**



Mechanical Shaft Seals two, Independent; Seals rated for **25bar** pressure capability for **L_{10h}** life in upto excess of **50,000h**



Robust Tank like Build



A Strong Shaft for Fail Safe Operation



Low Energy Cost : Due to Elimination of many Ancillary & Auxiliaries; **Wire to Water Power Consumption** of SubCF based Pumping Station is **slightly Lower** (compared to Conventional Bare Shaft Pump - Motor Set based Pumping Stations).*



No need for Frequent Periodic....



Shafts/Sleeves &/or Coupling



Gland Packing



Oil &/or Grease



Minimal Noise, Vibration & Heat Emission; due to **elimination** of Auxiliary & Ancillary systems (like Forced Water Lubrication, Thrust Bearing Cooling system, Motor Heat Exchanger).

Ultra Low ManPower Requirement



- **Requires No Special Pre – Post / Ancillary-Auxillary Operations** (like Valve Opening- Closing, starting-stopping-monitoring Forced Water Lubrication systems operation etc.)
- **Requires No Consumables** (like Oil, Grease, Gland Ropes, Bush, Pins, Couplings, Sleeves, etc)
- **Requires No Routine Maintenance** (like Gland Tightening, Gland Rope replacement, Shaft Alignment etc.)

Intelligent InBuilt Monitoring



Easy Monitoring (& Remote Control[#]) of your Pumpset's Health.

- **PSLD** detects Pressurized Water Leakage from Mechanical Seals.
- **CCWLD** detects Accidental Water Leakage from Cable Sheath's Cuts &/or Nicks into the Motor.
- **SBWLD** detect Accidental Water Leakage in to Motor's Stator Chamber.
- **BTDs** in the form of Bi-metallic Switches (for All Pumpsets) & RTD's (PT100 - 3 Wire Simplex type - from Size > 150kW) to Monitor Bearing Temperature (without any Additional Cost)[#].
- **WTDs** in the form of Bi-metallic Switches (for All Pumpsets) & RTD's (PT100 - 3 Wire Simplex type - 1 per each Phase - from Size > 150kW) to Monitor Winding Temperature (without any Additional Cost)[#].

[#]requires additional communication hardware



Saves (upto 75%) Spare Parts & Consumables*



Saves (upto 66%) O&M Staff*



Low Life Cycle Costs (LCC)*

^{*}(refer marketing@aquapumps.com for additional white papers)



SIMPLEX INFRASTRUCTURES LIMITED
 NATIONAL THERMAL POWER CORPORATION LTD,
 NORTH KARANPURA SUPER THERMAL POWER PROJECT SITE,
 TANDWA, CHATRA (Jharkhand)
 Office: NTPC NKSTPP, P.O.TANDWA, DIST: CHATRA, JHARKHAND - 825321
 Email ID: C3177@simplexinfra.net

AN ISO 9001-2008 CERTIFIED COMPANY
 CIN NO.L45209 WB PLC 004965

To Whom So Ever It May Concern

This is to certify that we are using "AQUA" make Submerged Centrifugal Raw Water Pump sets (manufactured by M/s. Aqua Machineries Pvt. Ltd. Ahmedabad) (Air Filled, Dry Motor) for Raw Water Intake at our North Karanpura Super Thermal Power Project, 3 x 660 MW; Barrage & Intake Water System.

Model	: ARS_V_AC_1st_VoG_5063_MQ_L....._0315_00415_NJ
Head	: 20 mwc
Flow	: 3000 m3/hr
Motor	: 315hp
Qty	: 6 no's
Year of Commissioning	: January - 2022

Above pump sets are installed on Automatic Coupling System with Integral Bend & Pump Monitor Unit which allows installation & removal within few minutes. They require no routine maintenance checks like Alignment checking, Gland Rope checking & its replacement/ tightening & have very long preventive maintenance intervals (like Mechanical Seal Replacement, Grease Replacement, etc - often up to 5years).

The installed pump sets are very simple to operate, require no pre start procedures & have been running smoothly & giving satisfactory performance in raw turbid waters since commissioning.

We are satisfied with the pump's performance & courteous After Sales & Service support during the ITC stage.

This certificate is issued for Tendering purpose only.

For Simplex Infrastructures Limited
 Project Incharge
 North Karanpura Super Thermal Power Project
 SIMPLEX INFRASTRUCTURES LIMITED

[Formerly: SIMPLEX CONCRETE PILES (I) LIMITED]
 BRANCHES: 501-D POKHAM CHAMBERS, SHIVSAGAR ESTATE, WORLI MUMBAI- 400 016. PH: 2491-3481/8397/3537 FAX: (022) 2491-2735.
 Email: scpl@simplexinfra.net, YAKUNTH @ (2nd FLOOR), 82-83 NEHRU PLACE, NEW DELHI: 110 019.

DATE 28.09.2024

TO WHOME SEVER IT MAY CONCERN

This is to certify that we have are using "Aqua" Make Submerged Centrifugal Raw Water Pumps-sets, Manufactured by Aqua Machineries Pvt. Ltd, Ramol, Ahmedabad for Raw Water **Intake** at our Super Thermal Power Project(North Karanpura) 3*660MW.

Project: STPP, North Karanpura 3*660MW
 End Client: NTPC-NK
 Contractor: Simplex Infrastructures Limited.

The pump set details at **Barrage & Intake** Water System are as follows:
 Model: ARS_V_AC_1st_VoG_5063_MQ_L....._0315N_00415_NJ
 Discharge: 3000 m3/hr.
 Head: 20 mwc.
 HP: 315HP.
 Qty: 06Nos .

Year of Commissioning:- JAN-2022.

Above pump-sets are installed on **Auto Coupling** System with Integral Bend which allows installation & removal within few minutes. They require no routine maintenance checking, Gland Rope checking & its replacement/tightening & have very long preventive maintenance intervals(Like Mechanical Seal Replacement, Grease Replacement etc).

We are satisfied with the pump's performance & courteous After Sales & Services support during the ITC stage.

For:

lalBabu
 श्री लाल बबु शर्मा / LAL BABU SHARMA
 श्री सहायक (प्रमुख सहायक) डीएम (O&M) / DGM (O&M)
 एन.टी.पी.सी. लिमिटेड / NTPC Limited
 एन.टी.पी.सी.पी.सी. / NKSTPP
 रामोल, रावट / Tandwa, Chatra



Aqua is the Proud recipient of the Prestigious

Best Quality Pump Vendor

by



Aqua Machineries Private Limited

www.aquapumps.com

Registered Office & Manufacturing Plant

Survey No. 504/1-2, 442/2, Near Haridarshan Estate, Near Express Highway, Ramol, Ahmedabad-382 445. Gujarat, India.

marketing@aquapumps.com